

FIG. 1

2030750

FIG. 2

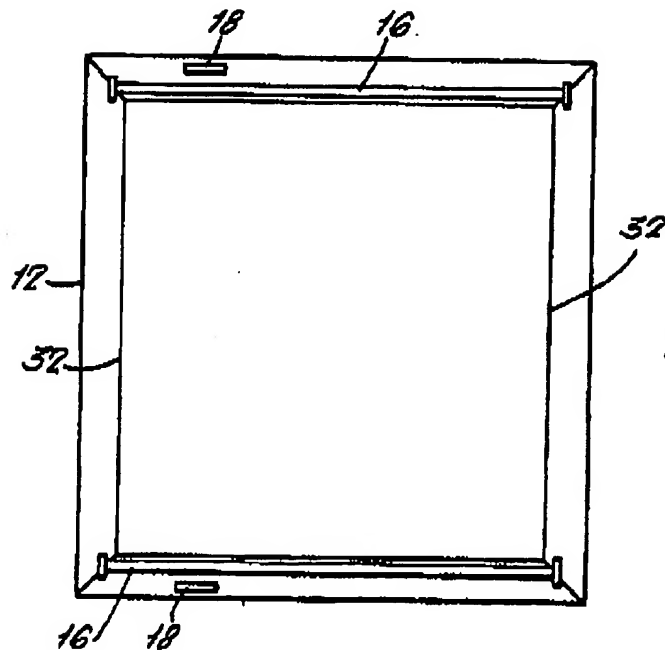


FIG. 3

2030750

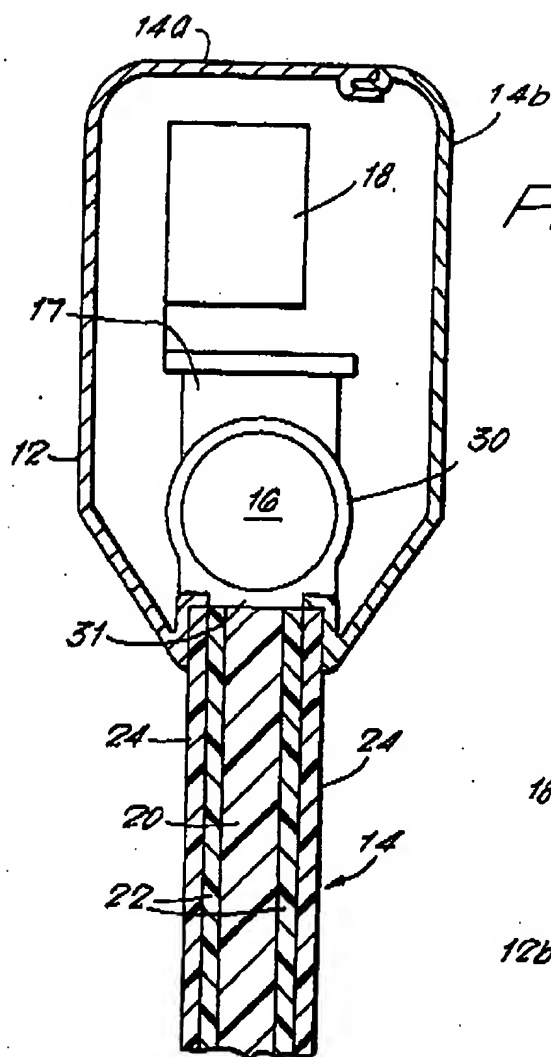


FIG. 4.

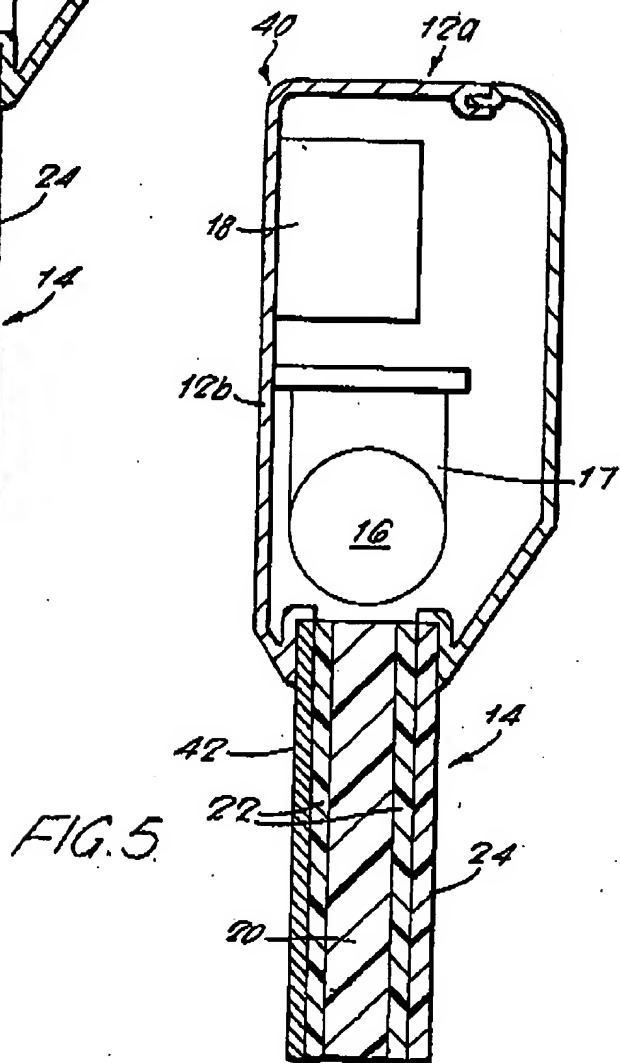


FIG. 5.

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SPECIFICATION

Illuminating signs

- 5 This invention relates to illuminated signs, for example of the type used to display advertisements or information.

Such signs generally comprise a frame containing one or more light sources such as fluorescent tubes covered by a translucent diffuser sheet over which the sign information is placed. In order to provide relatively even light brightness across the whole of the sign, the frame must be relatively thick so that the light sources are not placed too close to the diffuser sheet.

- It is therefore an object of this invention to provide an illuminated sign which can be relatively thin but still give even illumination of the whole area of the sign.

According to the invention there is provided an illuminated sign comprising a transparent sheet of light-conducting material, at least one light source mounted adjacent at least one edge of the sheet so that the light emitted by the source enters the sheet, at least one side of the sheet having a substantially evenly roughened surface whereby light received at an edge of the sheet leaves that surface of the sheet, a translucent diffuser sheet contiguous with the roughened surface or surfaces of the sheet, and a transparent outer covering sheet contiguous with the diffuser sheet or sheets.

- Such a sign can give very even illumination since the light will be conducted throughout the area of the transparent sheet and so acts as a light guide and the light will leave the roughened surface or surfaces evenly. The translucent diffuser sheet gives a further guarantee of evenness of illumination.

Information or advertising material can be provided over this diffuser sheet and it will be protected by the transparent outer sheet both from the elements and from abrasion or the like. The background will however be very uniformly illuminated. Because the various sheets can be quite thin, the sign can be very much thinner than conventional signs. The main limitation on size will be the light source. If this is a fluorescent tube or other strip-light it can however be quite thin and since it is positioned at the edge of the sign its size need not limit the size of the illuminated part of the sign.

- The more intense the light source the brighter the illumination of the sign. In addition the brightness of the sign can be improved by cutting down on losses of light from the edges of the light-conducting sheet, e.g. by covering those edges not adjacent a light source with a reflecting strip or coating. Additionally if the light source is a strip light this can be provided with a reflector to direct all of the light from the strip light towards the edge of the central sheet.

Illuminated signs according to the invention will now be described, by way of example, with reference to the accompanying drawings in which:

- 70 *Figure 1* is a perspective view of a double-sided sign according to the invention;
Figure 2 is an upright sectioned elevation through the sign;

Figure 3 is a sectioned view taken on the 75 line 3-3 of Fig. 2;

Figure 4 is an enlarged sectional detail of part of Fig. 2; and

Figure 5 is a detail similar to Fig. 4 of a single-sided sign according to the invention.

- 80 The double-sided illuminated sign 10 shown in Figs. 1 to 4 includes an outer housing 12 and an illuminated area 14. As best shown in Fig. 4, the housing 12 accommodates a discharge tube light source 16 supported by a holder 17, and fits over the edge of the illuminated area 14. The housing is conveniently made up of extruded aluminium strips. Besides the light source 16, the housing also contains the electrical components: 90 therefor including ballast 18 and electrical wiring. The housing is composed of two mating parts, 14a and 14b, which can be separated to gain access to the light source 16.

The illuminated area includes a central 95 transparent acrylic plastics sheet 20 of which acts as a light guide and whose edges receive light from the light source. These edges should therefore have a highly polished finish. The surfaces of this sheet 20 have been 100 roughened, e.g. by sandblasting so that as a result light leaves these roughened surfaces. The degree of roughness required to achieve this can readily be found by simple experiment for the particular type of material and 105 accordingly particular refractive index of the sheet 20.

Sandblasting is a simple way of achieving the required roughness and also gives a roughness which can be substantially uniform 110 across the surface. Contiguous with the roughened surfaces of the sheet 20 are two diffuser sheets 22 of translucent material, e.g. translucent plastics materials or other diffuser material as used in conventional signs to 115 ensure thorough diffusion of the light and evenness of illumination throughout the area 14. Finally contiguous with each diffuser sheet 22 is an outer transparent protective sheet 24, e.g. of clear pvc.

- 120 The information which the sign is to impart can be positioned between the sheets 22 and 24. For example this information can be an advertising sign, symbol, poster or the like or can simply be information such as for example the word EXIT. The information can be 125 provided on a separate transparency or outer layer positioned between the two sheets 22 and 24 so that it can readily be changed at intervals or can, for example, be printed, e.g.

130 by silk screening or otherwise adhered to the

surface of the sheet 24 which is adjacent the sheet 22. Alternatively the information can be incorporated within the body of the sheet 24.

- It is desirable that the illuminated area 14 be as bright as possible or use the light energy as fully as possible. Accordingly there is preferably provided over the strip light source 16 a reflecting cover sheet 30 which directs as much of the emitted light as possible to the edge of the sheet 20 and so into the body of the sheet.

- As best shown in Figs. 2 and 3, the sign 10 has two light sources 16 extending along adjacent the upper and lower edges of the area 14. This is not essential and, depending upon the required intensity or brightness of the sign, only a single light source or four light sources can be provided. To prevent loss of light from the edges of the sheet 20 which are not adjacent light sources, e.g. the side edges 32 (Fig. 3), such edges are desirably covered with a reflecting strip or layer to return light into the body of the sheet.

- As best seen from Fig. 1 the sign has the advantage of a simple and neat outside appearance. In addition it can be relatively thin yet the area 14 can still be illuminated very evenly; indeed the area 14 can be very much thinner than the housing 12.

- The sign 10 is a double-sided sign with the same or different information visible through the two sheets 24. The modified sign 40 shown in Fig. 5 is a single-sided sign and where identical parts are employed to those employed in the sign 10 they are given the same reference numeral and are not described further.

- Referring to Fig. 5, the housing 12a is of modified shape with a flat rear portion 12b capable of being fitted flush with a wall if required.

- In addition one of the sheets 24 is replaced by a metal or other opaque sheet 42 at the rear of the illuminated area 14. Preferably this sheet 42 is a metal sheet such as an aluminium sheet which has a reflecting surface to return light emitted by the rear translucent sheet 24. In addition the rear sheet 22 can be omitted and the rear surface of the sheet 20 is then preferably not roughened but has a highly polished surface so that only very little light escapes from the sheet 20 towards the rear.

- In both signs the sheet or sheets 24 are preferably made so as to be removable from the other sheets so that different information can be presented and/or the sheet 24 replaced if it becomes damaged. On the other hand the sheet or sheets 22 can be permanently adhered to the sheet 20 if so desired but this is not essential.

A further advantage of the invention is that the sign can take any shape or size and need not even be flat provided the sheet 20 can

- conduct light substantially evenly to all areas

of the sheet. Additionally the sign can be made relatively cheaply and can be relatively light-weight, particularly if the various sheets 20 to 24 are made of plastics materials.

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CLAIMS

1. An illuminated sign comprising a transparent sheet of light-conducting material, at least one light source mounted adjacent at least one edge of the sheet so that light emitted by the source enters the sheet, at least one side of the sheet having a substantially evenly roughened surface whereby light received at an edge of the sheet leaves that surface of the sheet, a translucent diffuser sheet contiguous with the roughened surface or surfaces of the sheet, and a transparent outer covering sheet contiguous with the diffuser sheet or sheets.

2. An illuminated sign as claimed in Claim 1 which is double-sided and in which both sides of the transparent light-conducting sheet have roughened surfaces, each roughened surface having a diffuser sheet contiguous with it and covered in turn by a outer transparent protective sheet.

3. An illuminated sign as claimed in Claim 1 which is single-sided and in which at least one surface of the transparent light-conducting sheet has a roughened surface, that surface having contiguous with it a diffuser sheet covered in turn by an outer protective surface, the outer surface of the transparent light-conducting sheet being covered with an opaque sheet.

4. An illuminated sign as claimed in Claim 3 in which the opaque sheet has reflecting surface.

5. An illuminated sign substantially as herein described with reference to Figs. 1 to 4, or Fig. 5, of the accompanying drawings.

Printed for Her Majesty's Stationery Office
by Burgess & Son (Abingdon) Ltd.—1980.
Published at The Patent Office, 25 Southampton Buildings,
London, WC2A 1AY, from which copies may be obtained.